

Chapter 1 – Section 2

p. 22-26



Measuring Matter

- I. **Weight** – a measure of the force of gravity
 - A. **Changes** if you go to the moon or another planet **since their force of gravity may be greater or less than Earth's**

Link: Calculate your weight on other planets

- II. **Mass** – measure of how much matter an object contains
 - A. **Will not change** if the force of gravity changes

III. **Volume** – amount of space an object takes up

A. **Volume = length x width x height**

1. **Units are m^3 or cm^3 for solids**

B. **Liquids are measured in L or mL**

C. **$1 \text{ mL} = 1 \text{ cm}^3$ & $1000 \text{ L} = 1 \text{ m}^3$**

IV. **Density** – measure of how much mass of a substance is contained in a given volume

A. **Density = Mass/Volume**

B. Units are typically grams/cm^3 or any unit of mass divided by a unit of volume

C. **Density of water = 1.0 g/cm^3**

1. Substance w/ density **GREATER** than **1.0 g/cm^3 SINKS** in water!

2. Substance w/ density **LESS** than **1.0 g/cm^3 FLOATS** in water!

D. Density is a **characteristic property**

Volume of a Solid By Water Displacement

1. Fill graduated cylinder w/ water; record volume of water (mL)
2. Place object to be measured into graduated cylinder
3. Observe rise in water level (called displacement) and record NEW volume of water
4. Formula: Volume of object = Volume of water after object added
– Volume of water before object added
5. Convert your units: $1 \text{ mL} = 1 \text{ cm}^3$